Notes on neotropical Saturniidae: Descriptions of the females of *Citheronia volcan, Adeloneivaia minuta, Kentroleuca novaholandensis, Gamelia remissoides,* and *Arsenura thomsoni thomsoni* (Lepidoptera: Saturniidae)

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Abstract: The thus far unknown females of *Citheronia volcan* Lemaire, 1982, *Adeloneivaia minuta* (Bouvier, 1927), *Kentroleuca novaholandensis* Lemaire & C. Mielke, 2001, and *Gamelia remissoides* Lemaire, 1967 are described and figured for the first time; some additional information on *Arsenura thomsoni thomsoni* Schaus, 1906 is given and the female is figured as well.

Keywords: Distribution, Neotropical, taxonomy, Saturniidae, Ceratocampinae, Hemileucinae, Arsenurinae.

Notas sobre Saturniidae Neotropical: descrição das fêmeas de *Citheronia volcan, Adeloneivaia minuta, Kentroleuca novaholandensis, Gamelia remissoides* e de *Arsenura thomsoni thomsoni* (Lepidoptera: Saturniidae)

Resumo: As fêmeas de *Citheronia volcan* Lemaire, 1982, *Adeloneivaia minuta* (Bouvier, 1927), *Kentroleuca novaholandensis* Lemaire & C. Mielke, 2001, *Gamelia remissoides* Lemaire, 1967 são descritas e figuradas pela primeira vez; a fêmea de *Arsenura thomsoni thomsoni* Schaus, 1906 é figurada e informações adicionais sobre este táxon são fornecidas.

Anmerkungen über neotropische Saturniiden: Beschreibungen der Weibchen von *Citheronia volcan, Adeloneivaia minuta, Kentroleuca novaholandensis, Gamelia remissoides* und *Arsenura thomsoni thomsoni* (Lepidoptera: Saturniidae)

Zusammenfassung: Die bisher unbekannten Weibchen von *Citheronia volcan* Lemaire, 1982, *Adeloneivaia minuta* (Bouvier, 1927), *Kentroleuca novaholandensis* Lemaire & C. Mielke, 2001 und *Gamelia remissoides* Lemaire, 1967 werden beschrieben und zum ersten Mal abgebildet; das Weibchen von *Arsenura thomsoni thomsoni* Schaus, 1906 wird abgebildet, und einige zusätzliche Informationen werden gegeben.

Introduction

Lemaire has published revisions on the American Saturniidae subfamilies Arsenurinae (1980), Ceratocampinae (1988) and Hemileucinae (2002), but then some species still were not completely known in both sexes. In this present article four unknown females are shortly described, two in the Ceratocampinae and two in the Hemileucinae subfamilies, and the female of *Arsenura thomsoni thomsoni* Schaus, 1906, so far only figured by Ecker (1990) once, is shown again. Additional collecting data for the species mentioned are given.

Material in the following collections was studied:

CBH Coll. Brosch, Hille, Germany.
CEFD Coll. Eurides Furtado, Diamantino, MT, Brazil.
CGCM Coll. Carlos G. C. Mielke, Curitiba, PR, Brazil.
COMC Coll. Olaf H. H. Mielke, Curitiba, PR, Brazil.
CSNB Coll. Stefan Naumann, Berlin, Germany.
UFPC Coll. Pe. Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, PR, Brazil.

Further abbreviations:

Fw[s] Forewing[s].
Fwl Forewing length, measured in a straight line from the base of the wing to the apex.
Hw[s] Hindwing[s].
PT Paratype.
Wsp Wingspan, with the inner Fw margin at 90° to the body.

Citheronia volcan Lemaire, 1982 (Figs. 1a, 1b)

Material studied: 1 ♀, 4 ♂♂. **Costa Rica: Cartago:** 1 ♀, 2 ♂♂ (CGCM 9.767, 10.381, 10.306), Tapantí, 1200–1700 m, 30.–31. viii. 2000, 20. viii.–15. ix. 1999, V. O. Becker leg.; 1 ♂ (CSNB), Refugio Nacional de Vida Silvestre de Tapantí, 1600 m, 18./19. viii. 1990, received from J.-M. Cadiou. – **PA [Puntarenas]:** 1 ♂ (CGCM 9.924), Monteverde, 1500 m, 1.–4. ix. 1999, V. O. Becker leg.

Diagnosis ♀: Wsp 133 mm; Fwl 67 mm. Fw moderately elongated, not pointed, outer margin straight up to CuA_1, and convex from CuA_1 to tornus; ground colour reddish gray, veins red marked. Reddish and irregular antemarginal line; discal spot light yellow; interveins spots coppery and rounded, two basal spots whitish. Ventral Fw with basal area pale yellow, medial area orange anteriorly and yellow posteriorly, marginal area gray with red marked veins; interveins spots pale yellow. Hw light yellow; posterior basal area, stigma, medial and marginal bands orange; medial band wide uniform. Ventral Hw yellow, stigma orange; medial band gray from $Sc+R_1$ to M_3 and then diffuse to anal angle; marginal area gray according to the medial band. Thorax orange with lines yellow and two yellow spots at metathorax, legs orange. Abdomen dorsally orange, yellow ringed anteriorly, ventrally yellow with two orange spots posteriorly.

Remarks: The ♀ of *C. volcan* differs from the ♀ of *C. azteca azteca* Schaus, 1896 by the coppery and rounded interveins spots, a suffused reddish postmedial band, the yellowish ground colour of Fw and the uniformous medial band of the Hw. The subspecific status of *C. azteca albescens* Lemaire, 1973 needs further investigation. Chumpitasi (2005) shortly described and figured the last instar larva, found on *Microtropis occidentalis*

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(Celastraceae), from Costa Rica (Heredia), and figured a pair of moths in black and white to extremely small scale.

Adeloneivaia minuta (Bouvier, 1927) (Figs. 2a, 2b, 3a, 3b, 4a, 4b)

Material studied: 4 ♀♀, 14 ♂♂. **Brazil, Ceara:** 1 ♀, 1 ♂ (CGCM 17.990, 18.278), Santa Quitéria, Faz. Bem Posta, 20. III. 2005, A. Pessoa leg.; 1 ♀ (CGCM 18.294), Sobral, Serra da Meruoca, 9. III. 2005, A. Pessoa leg.; 3 ♂♂ (CGCM 18.117, 18.133, 18.389), Meruoca, Floresta, 10. III. 2005, A. Pessoa leg. – **Pernambuco:** 1 ♀, 2 ♂♂ (CGCM 10.675, 10.485, 11.043), Custódia, 21. VI. 1974, V. O. Becker leg. – **Alagoas:** 1 ♀, 8 ♂♂ (UFPC-DZ 9.121, 9.129, 9.137, 8.967, 8.975, 8.983, 8.991, 8.999), União, II. 1964, III. 1964, II. 1965, A. Cardoso leg.; 1 ♂ (UFPC-DZ 9.033), Palmeira dos Indios, 19. VII. 1974, A. Cardoso leg.

Diagnosis ♀: Wsp 47–50 mm; Fwl 23–27 mm. Antennae dark yellow, frons similar to thorax pattern. Thorax brown to light brown, legs purple. Fw elongated. Outer margin convex. Ground colour pale yellow or pale brown, light to heavy brown sprinkled scales, antemedial line indistinct, postmedial lines convex to slightly convex. Discal spot slightly marked. Hw lighter than Fw, few sprinkled scales and medial line poorly marked. Ventral wings with same pattern, little bit lighter, lines and discal spot diffuse. Abdomen similar to thorax on dorsal and ventral sides, getting lighter posteriorly.

Remarks: Recent collecting at Ceara state, Brazil, revealed a good population of *Adeloneivaia minuta*. The dark sprinkled scales are very variable within the species. A ♂ from same locality as the ♀♀ is fugured as well.

Kentroleuca novaholandensis Lemaire & C. Mielke, 2001 (Figs. 5a, 5b)

Material studied: 3 ♀♀, 24 ♂♂. **Brazil, Maranhão:** 3 ♀♀, 22 ♂♂ (CGCM 16.526, 16.459, 16.483, 15.393 PT, 15.291 PT, 15.650, 14.520, 15.456, 1.883, 1.675, 1.653, 1.990, 1.799, 2.214, 1.642, 2.399, 2.374, 16.750, 16.770; EF 11.095, 12.957, 12.958 13.198, 13.199; OM 53.282 PT), Balsas, Serra do Penitente, 480–550 m, 23. x. 2000, 20. x. 2001, 2. XI. 2002, 5.–6. XI. 2004, C. Mielke leg.; 1 ♂, same locality, x. 2000, ex coll. Thierry Porion (CBH); 1 ♂, same locality, x. 2000, ex coll. Thierry Porion (CSNB).

Diagnosis ♀: Wsp 77–91 mm; Fwl 39–47 mm. Antennae black, frons yellowish gray, thorax reddish brown, legs black. Fw moderately elongated, outer margin convex; ground colour either reddish brown or reddish brown getting lighter distally, antemedial and postmedial lines bordered with black, the latter straight to concave; discal stria white to almost absent. Hw shows same ground colour, little lighter at basal area; postmedial line black and diffused. On ventral side, wings with same pattern, both postmedial lines of Fw and Hw suffused white. Abdomen dark yellow on dorsal side, light gray on ventral side, spiracles surrounded by black scales.

Remarks: ♂♂ are common at the type locality and are attracted to light rarely before 22:00 h, mostly after 1:30 to 4:00 h. ♀♀ come to light early in the night. The species seems to be monovoltine.

Gamelia remissoides Lemaire, 1967 (Figs. 6a, 6b)

Material studied: 9 ♀♀, 22 ♂♂. **Brazil, Rio de Janeiro:** 3 ♀♀, 3 ♂♂ (UFPC-DZ 9.006, 8.998, 9.014, 9.023, 8.910, 8.918), Petrópolis, 23. XI. 1957, D'Alm., Nysio, César leg.; 3 ♂♂ (UFPC-DZ 8.926, 9.007, 9.015), Petrópolis, 15. III. 1961, 31. I. 1960, 15. X. 1958, Gagarin leg.; 1 ♀ (UFPC-DZ 9.022), Petrópolis, Independência, 17. VI. 1931, P. Gagarin leg. – **São Paulo:** 1 ♀, 3 ♂♂ (UFPC-DZ 8.901, 8.950, 8.958, 8.974), Umuarama (Campos do Jordão), 1800 m, 3.–15. II. 1937, 8.–15. III. 1937, 27. X. 1937, P. Gagarin leg.; 1 ♀, 4 ♂♂ (UFPC-DZ 8.917, 8.982, 8.990, 8.934, 8.942), Salesópolis, Boracéia, 10. XII. 1941, 13. XII. 1941, 15. XII. 1941, 16. IV. 1943, 15. X. 1943, D'Almeida leg; 1 ♀ (CGCM 11.821), Campos do Jordão, 1700 m, 5.–12. I. 2002, V. O. Becker leg. – **Paraná:** 1 ♀ (CGCM 11.870), São José dos Pinhais, Morro do Meio, 2. I. 1970, Becker & S. Laroca leg; 1 ♂ (CGCM 13.353), São José dos Pinhais, Estrada Castelhanos, 700 m, 10.–11. II. 1997, Miers & C. Mielke leg.; 2 ♂♂ (CGCM 7.851, 6.363), Tijucas do Sul, Vossoroca, 800 m, 3. IV. 1999, C. Mielke leg. – **Santa Catarina:** 1 ♀, 4 ♂♂ (CGCM 1.105, 1241, 810, 11.730; EF 9.046), São Bento do Sul, Rio Natal, 500 m, I. 1997, 20. X. 1997, 15. II. 1989, A. Rank leg.; 1 ♂ (UFPC 8.909), Seara, Nova Teotônia, XI. 1961, Fritz Plaumann leg.; 1 ♂ (CGCM 13.270), Urubici, Morro da Igreja, 1250 m, 21.–24. XII. 1998, Miers & C. Mielke leg.

Diagnosis ♀: Wsp 56–64 mm, Fwl 30–35 mm. Antennae dark yellow. Frons, labial palpi and thorax reddish brown with legs dark brown. Fw apically pointed out, outer margin concave at first $^{1}/_{5}$ and convex at $^{2}/_{5}$; lines dark brown, antemedial line irregular and convex; postmedial line straight, distally bordered by a lighter brown, at inner margin it is bent outward; antemedial area brown, median area well distinguished by a light pinkish brown with a small red discal spot; submarginal band slightly differed from marginal band by some gray scales; external margin pinkish. On the ventral side, basal and postmedial area gray; medial area reddish gray; postmedial line black and concave; marginal area reddish. Hw ground colour gray, outer margin straight from M1 to Cu1b; postmedial line dark gray, distally bordered by a lighter pink; submarginal band broad, little darker than basomedian area; marginal band brown; eyespot red with a black ring. Ventrally, reddish brown ground colour, postmedial line thin, straight and black; postmedial area with some gray scales. Abdomen dorsally lighter than thorax and ventrally orange to reddish brown.

Remarks: This species is rare, with few specimens known although intensive collecting has been done at its flight area. ♂♂ and ♀♀ are attracted by light early in the night.

Arsenura thomsoni thomsoni Schaus, 1906 (Figs. 7a, 7b)

Material studied: 1 ♀, 3 ♂♂. **French Guyana:** 1 ♀ (CGCM 15.105), Piste de Belizón, PK 37, 23. V. 1998, D. Carlot leg., 1 ♂ (CGCM 10.106), Piste Coralie, PK 2, 4. I. 1992; 1 ♂ (CSNB), Roura-Kaw, km 29, 12. XI. 1993; 1 ♂ (CSNB), Piste Kaw, pk 29, 12. XI. 1993.

Ecker (1990) figured only the upper side of the ♀ of *Arsenura thomsoni thomsoni* without any description of the specimen; here we add some additional information and figure both dorsal and ventral side of the moth.

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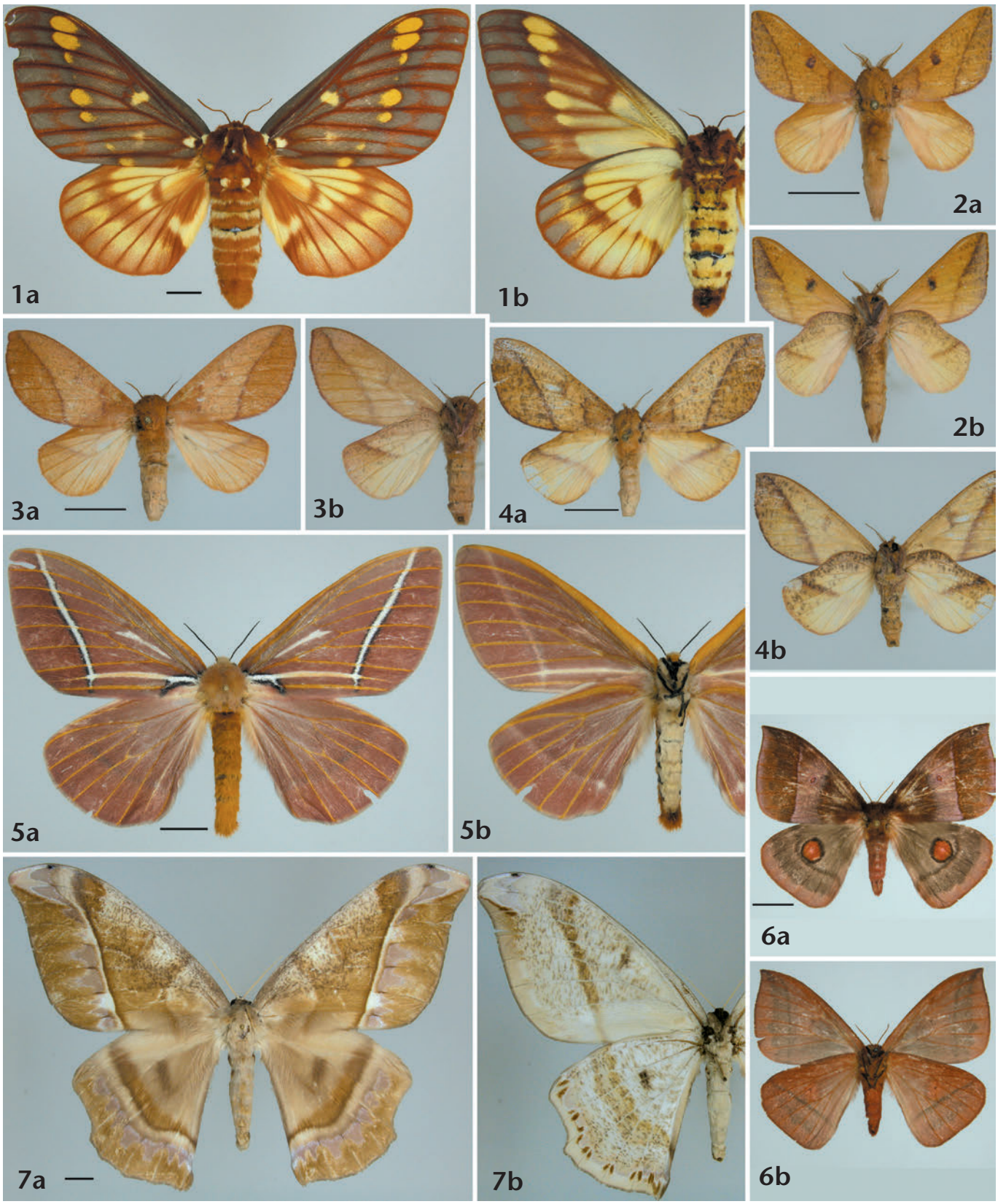

Figs. 1a, 1b: *Citheronia volcan,* ♀. 1a: dorsal, 1b: ventral. — **Figs. 2–4:** *Adeloneivaia minuta.* **Figs. 2a, 2b:** ♂. 2a: dorsal, 2b: ventral. **Figs. 3a, 3b:** ♀ #1. 3a: dorsal, 3b: ventral. **Figs. 4a, 4b:** ♀ #2. 4a: dorsal, 4b: ventral. — **Figs. 5a, 5b:** *Kentroleuca novaholandensis,* ♀. 5a: dorsal, 5b: ventral. — **Figs. 6a, 6b:** *Gamelia remissoides,* ♀. 6a: dorsal, 6b: ventral. — **Figs. 7a, 7b:** *Arsenura thomsoni thomsoni,* ♀. 7a: dorsal, 7b: ventral. — Specimens not to the same scale; scale = 1 cm; dorsal and ventral views of the same specimen approximately to the same scale.

Diagnosis ♀: Wsp 162 mm; Fwl 90 mm. Antennae light yellow. Frons dark brown. Thorax light brown dorsally, light gray ventrally, legs light gray. Fw slightly falcate, not elongated. Outer margin oblique; ground colour light brown, antemedial line indistinct and postmedial followed by a white narrow line; distally the postmedial line, purplish lobes arise from each cell; oval stigma slightly seen with whitish spot at center; the costal area is lighter. Hw with same pattern, discal spot dark brown; postmedial line dark brown, followed by a lighter band,

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from which arise lateral purplish lobes; margin concave between R_s and M_2, then convex and undulate from M_2 to 2A. Ventral wings with light gray, lines brown and discal spot black. At Hw a lighter marginal band is marked with brown spots along the veins; sprinkled scales present. Abdomen according to thorax patterns.

Remarks: The ♀ of *A. thomsoni thomsoni* differs from the ♀ of *A. sylla* (Cramer, 1779) by the pale ground colour, less or non-undulate postmedial lines of Fws and Hws. The status of *A. thomsoni lemairei* L. & T. Racheli, 1998 needs further investigation.

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